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UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Engineering

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: In a recent ruling of the Comptroller General regarding the :
: 1 cent Federal tax on gasoline, it was held that where purchases :
: of gasoline are made under a contract, the contractor is not :
: entitled to be paid any amount in addition to the price provided :
: for in the contract regardless of whether the price so fixed did or :
: did not include any amount to cover the tax or cost of collection. :
: However, where it is necessary to purchase gasoline in small quanti- :
: ties from retailers without a previous contract, the Government :
: must pay the price demanded, notwithstanding that it may have been :
: increased a sufficient amount to pass on to the consumer the Federal :
: tax and the cost of collecting the same. :
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: Attention is invited to recent decisions of the Comptroller :
: General regarding per diem claims when absence from official sta- :
: tion is less than 24 hours. In computing per diem in such cases :
: the day will be regarded as beginning with the hour of departure :
: and ending with the time of return to official station. One quarter :
: of the per diem rate will be allowed for absence of each period of :
: six hours or a fraction thereof; that is, assuming departure from :
: official station is 6 o'clock a.m. and return thereto is 8 o'clock :
: p.m. of the same day, the total absence is 14 hours and accordingly :
: three-fourths of the per diem allowance can be claimed. When the :
: absence is wholly between the hours of 8 a.m. and 6 p.m. no per :
: diem claim can be made. When travel is by automobile the necessity :
: for departure shortly before 8 a.m. and return shortly after 6 p.m. :
: must be explained. :
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: The attention of all employees is again called to the fact :
: that the use of Government owned automobiles and trucks for private :
: or personal business is absolutely prohibited. :
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Beginning August 16 Mr. McCrory and W. W. McLaughlin inspected the work being conducted by the Bureau in various parts of the West, visiting first the migratory bird refuge dikes and spill-boxes in Box Elder County, Utah, and the research work being conducted in Cache Valley, Utah. A conference was held in Boise, Idaho, and later the alkali experimental tract at Caldwell was visited. At Pullman, Washington, a conference was held with Director Johnson and other members of the station staff. An inspection was made of the cooperative soil erosion station at Pullman. At Walla Walla a stop was made to consult with agents of the Bureau of Entomology in reference to the mechanical control of plant pests. They next visited Hermiston, Oregon, to inspect the new substation of the Oregon Agricultural Experiment Station and the Bureau of Plant Industry, upon which it is anticipated this Bureau will conduct cooperative irrigation studies. Conferences were held at Portland with the Director of the Oregon Agricultural Experiment Station and at Corvallis with various members of the Agricultural College staff. The cooperative deciduous fruit investigations conducted on the substation and other orchards in the Rogue River Valley near Medford were inspected.

J. H. McCormick conducted some tests at Bard, Calif., to determine whether the soil below 3 feet, the observed depth of rooting as revealed by an open trench on a plot of second year alfalfa, would support plant growth. Samples were taken from the fourth, fifth and sixth feet at seven points on the plot. This soil was placed in plots and planted to milo maize, using the surface foot of soil as a check. The plants have been up for 16 days and little difference in appearance is noted between any of the plants. This would seem to indicate the lack of fertility does not restrain root development of the alfalfa below 3 feet on this plot. Uneven moisture penetration is more likely the limiting factor, since a 6-inch irrigation failed to penetrate deeper than 24 inches at 4 out of 7 points on the plot.

A vortex sand trap recently installed on the Roby Ditch near Fountain, Colo., is operating very effectively. The ditch carries large quantities of sand, but no sand is now found downstream from the sand trap. It was formerly necessary to flush out the ditch every day because of the accumulation of sand to a depth of 2 to 3 feet.

Irrigated cotton plants have grown steadily this season while non-irrigated plants have scarcely grown at all since early in July, according to Lloyd N. Brown, who is conducting experiments on irrigation of cotton in the San Joaquin Valley, Calif. One plot was irrigated for the first time on August 5 but the plants did not respond to the irrigation either by vegetative or fruiting activity although at the time the soil moisture, except in the first foot, was well above the wilting point. From this it appears that if cotton is not irrigated soon enough it will not recover and start to grow when it is irrigated. Experiments conducted by Mr. Brown on cotton plots on a ranch near Los Banos showed that an excess of water on light soil will produce a large but usually relatively unproductive plant.

..... On request of the Texas State Department of Agriculture, through the Texas Board of Water Engineers, O.A. Faris visited a 100 acre pecan orchard near Llano, with W.D. Sims, pecan expert of that Department, for the purpose of examining the irrigation system and suggesting the most

economical layout for the application of water. A topographic survey is now being made under the direction of Mr. Faris, by the State Department of Agriculture.

A map of the Zanesville, Ohio soil erosion experiment farm recently surveyed by P. L. Hopkins is being prepared at Bowling Green, Ohio. The report on "Tests of Concrete Exposed to the Action of Sulphate Waters" by D. G. Miller has been reviewed by the members of the Research Committee and L. A. Jones is conferring with Mr. Miller at St. Paul regarding its revision and preparation for publication.

A manuscript entitled "Obstruction of Pile Trestles to the Flow of Water" by D. L. Yarnell and Floyd Nagler has been submitted to the Washington office for approval for publication by the University of Iowa.

In the experiments on ditch cleaning in Delaware by W.D. Ellison the use of explosives is now being studied. Recently a ditch 2,700 feet long was cleaned with one large shot of dynamite.

Careful observations were made on the Bethany farm on two methods of conducting farm operations, one of which consisted of crossing the terraces at any angle and the other of following parallel to the terraces in machinery operations. Results indicate that less maintenance is required where operations are parallel to the terraces and that machinery operations are more satisfactory when working parallel to the terraces.

In combine operations on the soil erosion station at Pullman, Wash., P. C. McGrew found that the combine of the leveling type commonly used in that region could cross a terrace at any angle provided the terrace ridge did not touch the frame of the machine. Ordinarily this occurred on slopes greater than 25 per cent when operating perpendicular to the terrace. Wheat 3 or 4 feet high on slopes of 15 to 20 per cent was successfully harvested in operating the combine without regard to the terrace. On steeper slopes and shorter crop it was found that the combine should be operated parallel to the terrace.

From an experiment on the spacing of short terraces on a slope of 5.5 per cent on the Guthrie farm, H. S. Riesbol reports that a greater amount of erosion occurs for the wider spacing over an extended period of time. The total soil losses for spacings of 2, $3\frac{1}{2}$ and 5 feet for the year 1931 were 2.74, 3.96, and 4.98 tons per acre, respectively. Observations also showed that there was more gully erosion between the terraces for the wider spacings.

An experiment to determine the effect of plowing at right angles to the terraces, up and down the slope on the Guthrie farm indicates that this practice causes a rapid filling of the channel and a plowing down of the top of the terrace. It is believed that the extra expense required in maintaining the terraces and the possibility of the water overtopping the terraces before they can be built up are serious disadvantages as compared with the method of farming parallel to the terraces.

R. W. Baird reports that level terraces with closed ends on the Tyler farm were unable to hold all of the water from a rain of 5.95 inches and considerable damage was done to the terraces and crops in the terrace channels. Observations on the overtopping and erosion between two level terraces with open ends, 1,600 feet long with 2 and 3 foot vertical interval on a land slope of 4 per cent indicates that a spacing of 3 feet is preferable for this particular slope and comparatively sandy soil.

An experiment on the Hays project to determine erosion losses from different crops on terraced land indicates that the greatest soil loss occurs

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on land planted/Kaffir as compared with wheat or barley. Soil losses for the year 1931 were 606, 1,622 and 3,872 pounds per acre for wheat, barley and Kaffir corn, respectively.

Work has been rapidly progressing at the plant of the U.S. Cotton Ginning Investigations, Stoneville, Miss. Cotton has been secured from different sections of Texas, Georgia, Louisiana, Alabama and Mississippi, and many interesting tests have been conducted.

Several cotton driers have been installed this year in Arkansas, Mississippi and Alabama. C.A. Bennett recently inspected three new vertical driers in Arkansas.

A progress report on the 1931 fertilizer placement studies with beans in Florida has been prepared for publication in which G.A. Cumings and A.L. Sharp represent the bureau. The work was conducted at four locations in the vicinity of Winter Garden in cooperation with the Bureau of Chemistry and Soils. It was found that placement of 700 lbs per acre of a 5-7-5 fertilizer 2 inches or more to the sides of the seed or 3 inches directly below the seed resulted in good stand and yield, but fertilizer placed close to the seed severely injured germination and gave correspondingly low yields. On Sept. 1 Mr. Sharp went to Orlando, Fla., to take charge of planting operations in connection with a continuation of these studies. Experiments will also be conducted on the east coast where severe fertilizer injury has been experienced.

A laboratory has recently been completed at Arlington farm for use in the investigations of fertilizer distributing machinery. It is a one-story concrete building 54 by 68 feet which includes a rammed earth wall addition previously described. Air conditioning experiment has been installed for washing the air and controlling the relative humidity and temperature in two rooms, one 13 x 30 ft. and the other 5 x 7 ft. The air conditions can be controlled through the ordinary range of relative humidity at various temperatures.

W. M. Hurst reports that three experimental seed scarifiers, used for increasing the germination of seeds having a hard coating have been constructed for the Bureau of Plant Industry and tests will be made to determine their suitability for farm and experimental use.

In the trials with experimental sugar beet harvesters in Calif., conducted by E.M. Mervine and S.W. McBirney it was found that the mechanical topping of the beets resulted in a loss of only 0.62 per cent due to low topping and 3.5 per cent tare caused by high topping.

Claude K. Shedd and his cooperators have recently completed the construction of a dynamometer to make measurements of the power input to the drive wheels, power take-off and draw bar of a tractor. This will aid materially in determining power requirements and efficiency of corn production machinery.

On a recent trip which included all the Western States except South Dakota and Nebraska, S.P. Lyle found that the directors of extension are interested in improving their farm building plan service. They are also endeavoring to stimulate improvement in the application and consumptive use of irrigation water and an increase in the practice of irrigation in dry farming areas where practicable. In North Dakota Mr. Lyle noted a trend toward the use of the harvester-stacker for harvesting small grain. The chief advantages of this method seem to be early harvesting at low cost. In the State of Washington the chambers of commerce have encouraged a back-to-the-farm movement which has resulted in the settlement of 9,000 novice farmers in Western Washington. The establishment of these new farms introduces a number of extension engineering problems. In Colorado extension work in terracing both for erosion control and moisture conservation is being begun.